

# Tracking down chemical pollution in California wells

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In mid-December an employee at Aerojet General Corporation drew a water sample from a public well near the company's Irwindale, Calif., plant in the east San Gabriel Valley.

It was a routine check for any of the 129 chemicals the US Environmental Protection Agency (EPA) has flagged as potentially dangerous. "We weren't on any kind of hunt," Aerojet spokesman Floyd Brown says.

But the first sample turned up 600 parts per billion of trichlorethylene (TCE). The EPA limit for TCE, a synthetic chemical widely used as an industrial solvent, is 5 parts per billion. Recent tests have shown it to be carcinogenic and possibly harmful to humans in quantities much larger than were found near Irwindale and in an extensive search of the Los Angeles basin.

After Aerojet reported its TCE findings to the state Department of Health, a laborious search was conducted and unacceptable levels of TCE were found all over the basin. To date, 52 water wells have been closed.

Most of the wells checked in the San Gabriel Valley, 15 miles east of downtown Los Angeles, have been cleared. But enough traces have been found in different ground water systems in that valley and in other sections of the county — Santa Monica to the west, Burbank to the north, Compton to the south — so that officials know locating the source, or sources, will be difficult.

Officials working on the problem theorize that the pollution being found today is the result of misuse of TCE at least 15 years ago, before stringent regulations on handling and disposal were issued. Thus, the investigation will include a search of history books and property deeds to determine what industries operated in the area more than a decade or two ago.

"It's not going to be easy, unless we come up with one magic source," says Richard Harris, assistant executive officer of California's Regional Water Quality Control Board.

Finding a modern-day culprit is possible. But officials think the chances are slim that industry practices are still sloppy.

"It is a situation that needs to be investigated, but not one of total alarm," says William R. Ree, senior sanitary engineer with the Los Angeles Department of Water and Power.

Officials are beginning to wonder about cleaning up the contaminated ground water, a job more difficult than removing pollution from surface sources. Beyond closing the wells, only a thorough study of the hydrology and geology in the affected cities will determine what approach to take.

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The literature, of course, is full of stories about ancient astronauts and UFO episodes, but there is no convincing scientific evidence for any of these stories. For this reason Michael Hart has adopted the position that they are nowhere to be found, and therefore in all probability we must be all alone.

In all fairness, it must be stated that the colonization argument is not accepted by all. For example, two of the leading scientists in this field, Dr. Drake and Carl Sagan, also of Cornell, reject it. Dr. Sagan estimates it would take 10 billion years, not 10 million. Dr. Drake reckons it would simply be too uneconomical.

My own view is that the possibility that our galaxy has already been fully colonized cannot be dismissed until we have carefully searched throughout our own solar system, and in particular in the asteroid belt, for space colonies.

Such a search inside our solar system is already within the capabilities of our technology, in terms of both astronomical observations from Earth and direct spacecraft missions. It is quite possible, therefore, that by the turn of the century we will know whether our solar system has been colonized or not. We will also have searched our nearby stars for planets as well as for signs of any

technological activities, including radio, infrared, and optical signals, all of which are being considered by the SETI subcommittee as possible goals for the '80s.

If all these searches turn out to be negative, we ought to consider seriously the possibility that we might really be one of the very few, if not the only, advanced civilization in our galaxy. After all, if the ultimate goal of creation is to populate the entire galaxy with intelligent life, this goal can be achieved a thousand times faster by starting from a single star and colonizing all the others, rather than by waiting for intelligent life to evolve independently in each star.

In conclusion, it seems reasonable to expect that in the coming decades either we will discover that our galaxy is teeming with intelligent life and we will be invited to join an already blooming galactic society, or we will have to accept the idea that we are alone and it is up to us to infuse life into the entire galaxy. Standing at the threshold of such profound cosmic knowledge makes our times a unique and most exciting period in the history of man.

*Professor Papagiannis is the chairman of the Astronomy Department at Boston University.*

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The scientists stress that they have not proved their hypothesis. But they do marshal reasons and evidence showing it to be consistent with the fossil record. Furthermore, they note that the expected frequency of large asteroid impacts — about one in 100 million years — fits the frequency of major extinctions.

If this idea is correct, they expect to find worldwide evidence of the iridium anomaly, having already found it in Italy and Denmark. At the very least, their idea gives scientists a notion of what did in the dinosaurs — a notion they can follow up in the field and not just speculate about.